

The Oil and Gas Industry in Oklahoma: Economic Impacts Today and Tomorrow

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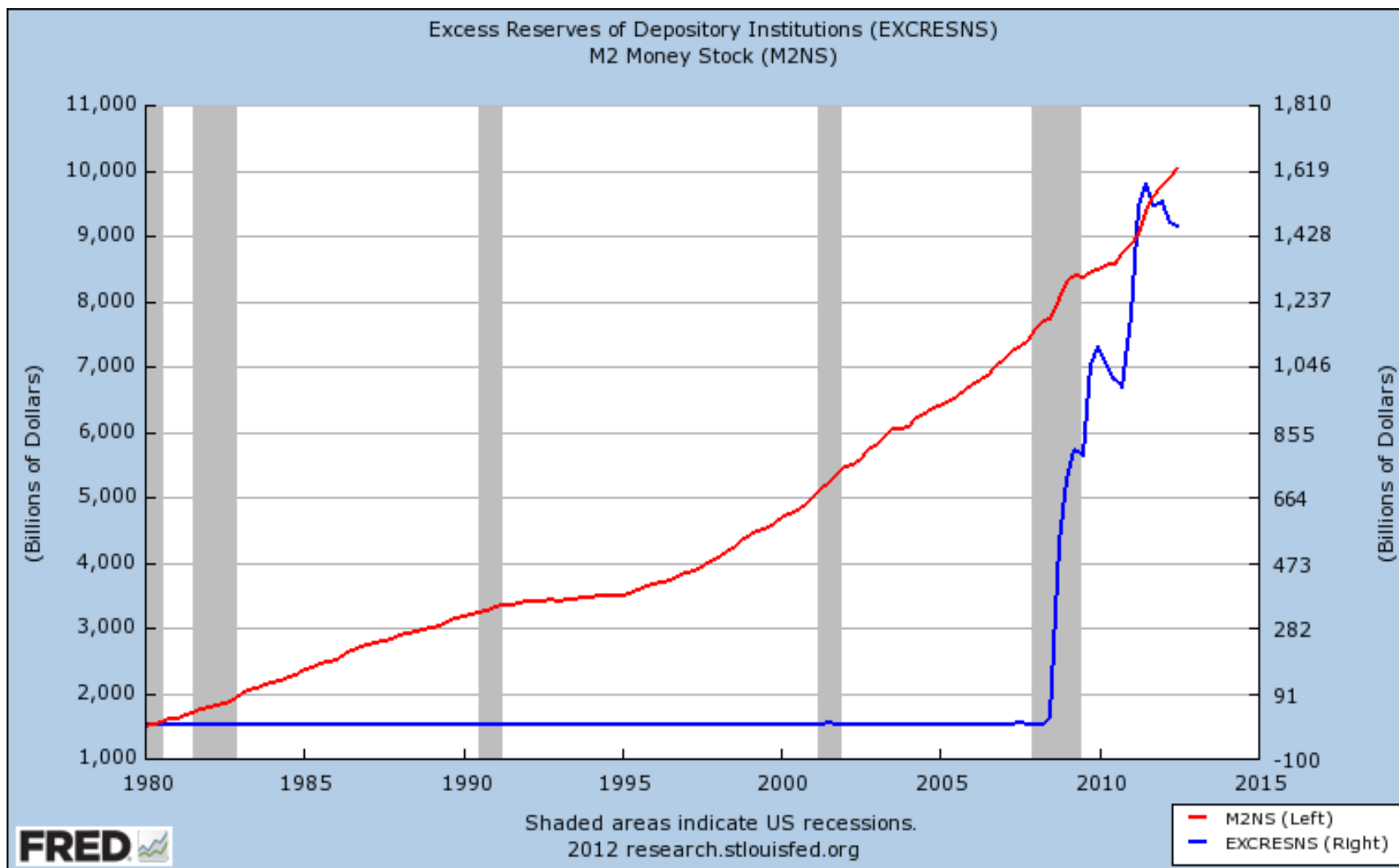
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U.S. Economic Outlook: Risks and Commentary

- Uncertainty is just unresolved expectations
- Expectations are unresolved with respect to:
 - Global economic growth
 - Future prices (inflation)
 - National debt and the fiscal cliff
- Business and consumer uncertainty
 - The further I get from my own sphere of influence, the less certain I become

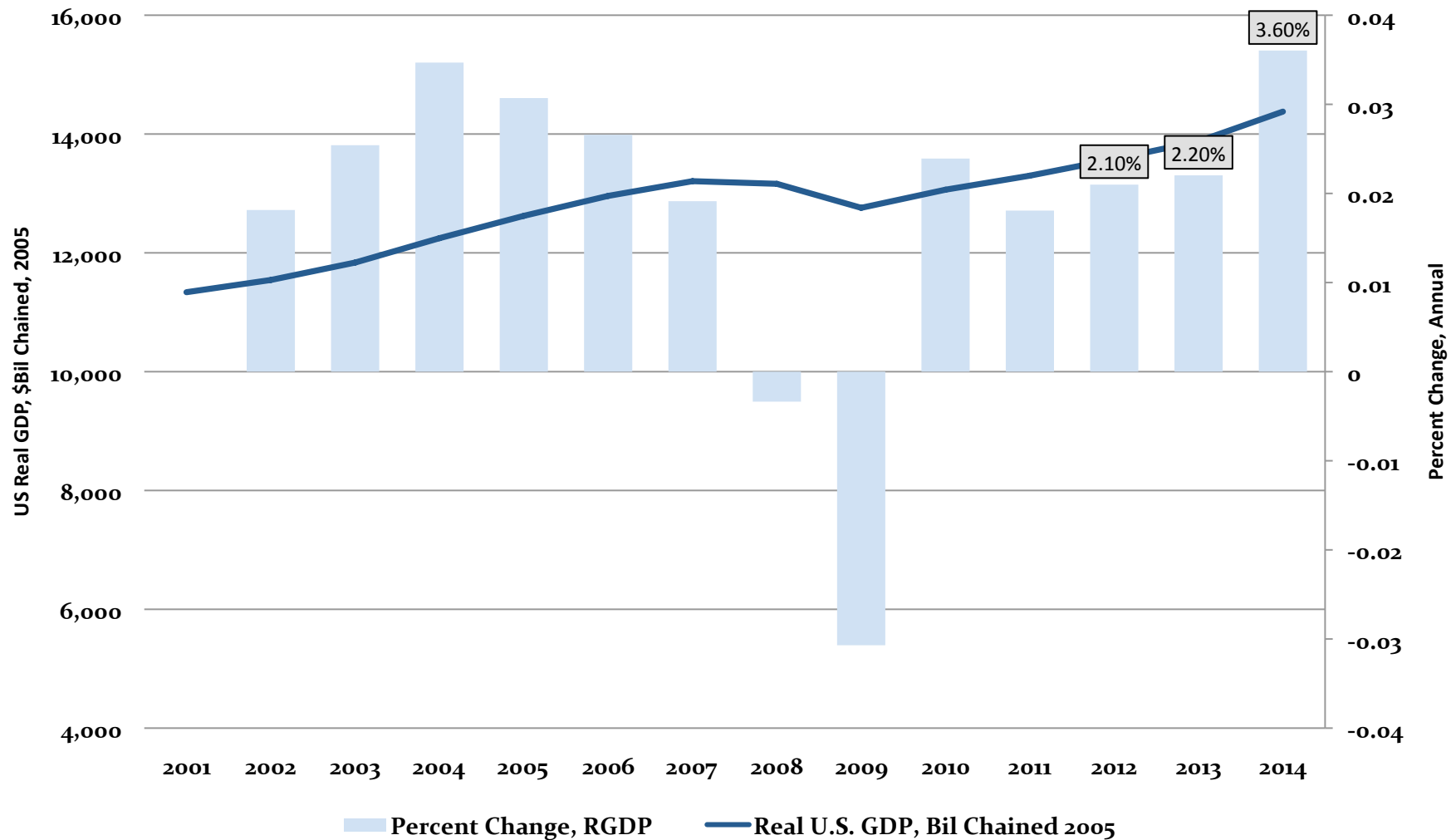


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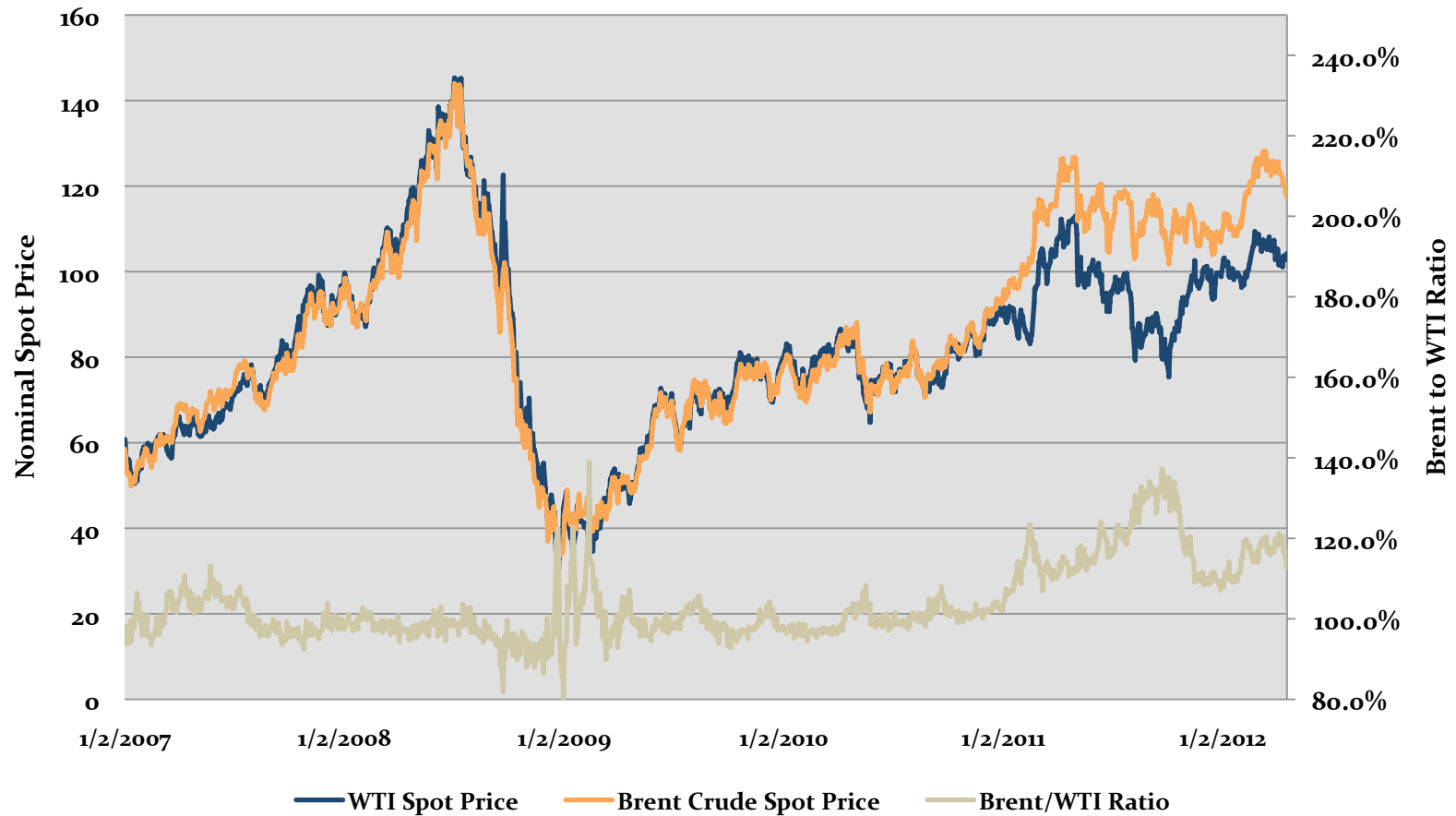
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US Real GDP and Annual Growth



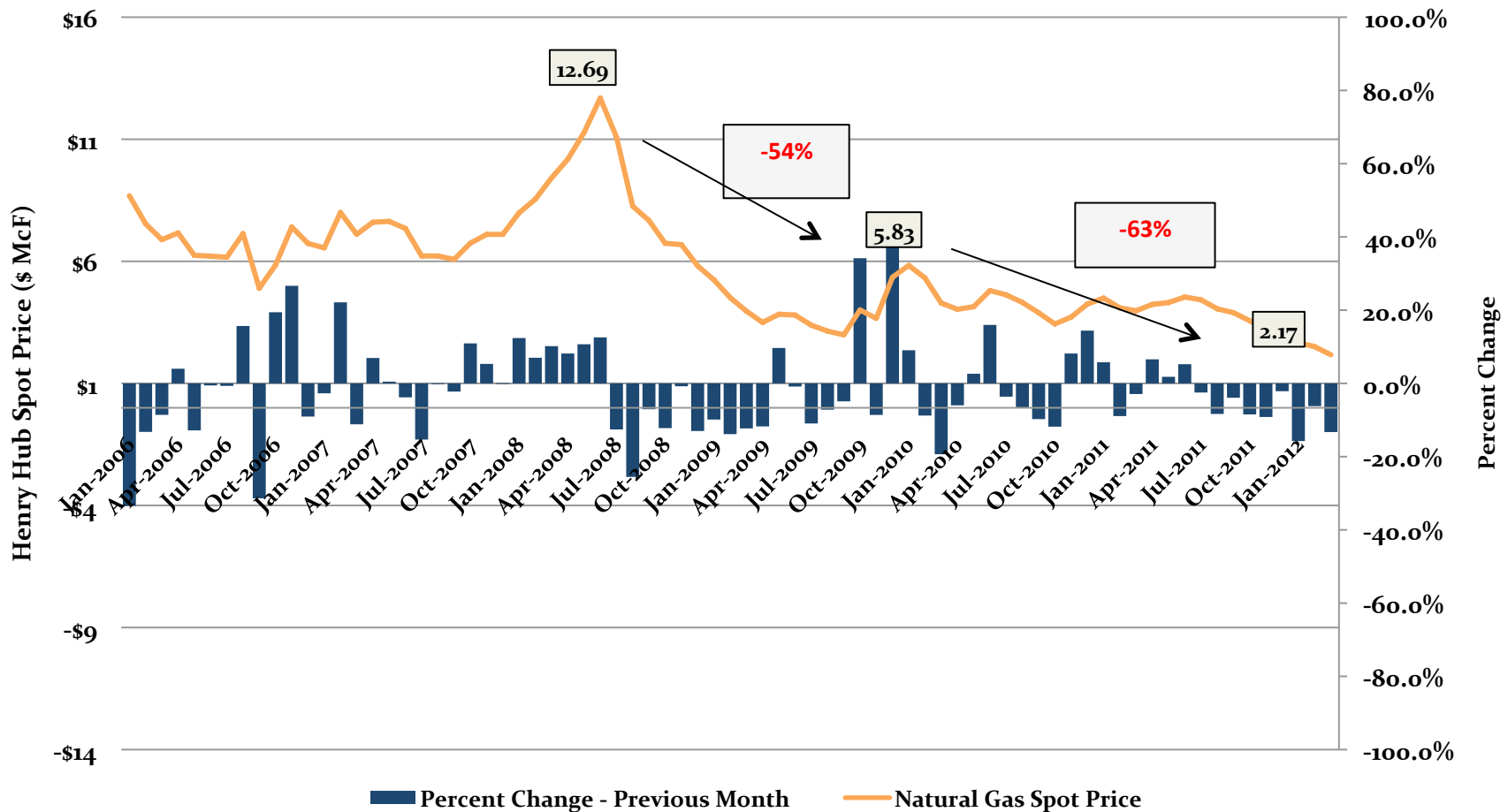
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WTI - Brent Crude Spot Price Relationship



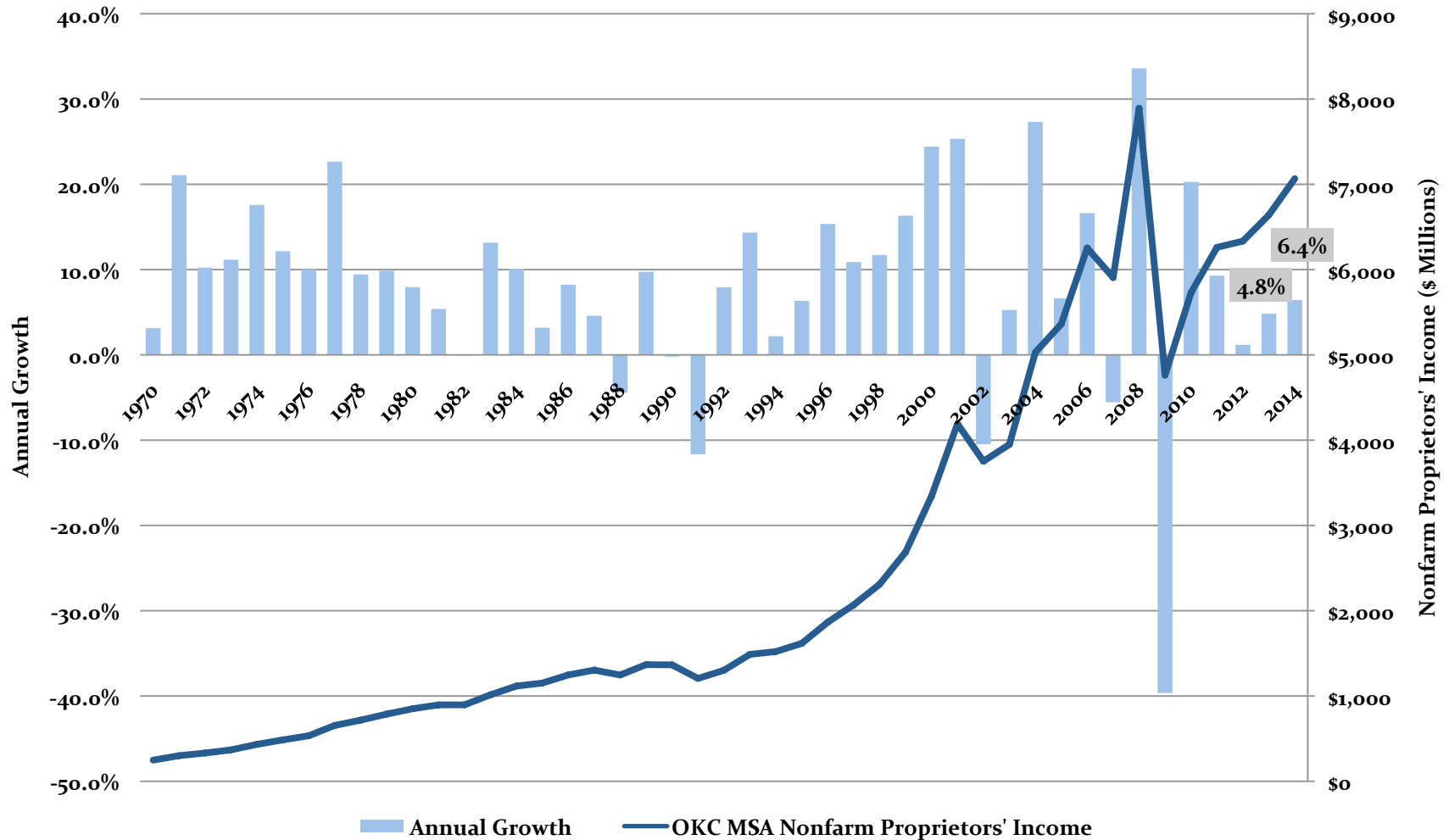
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Natural Gas Price and Monthly Change



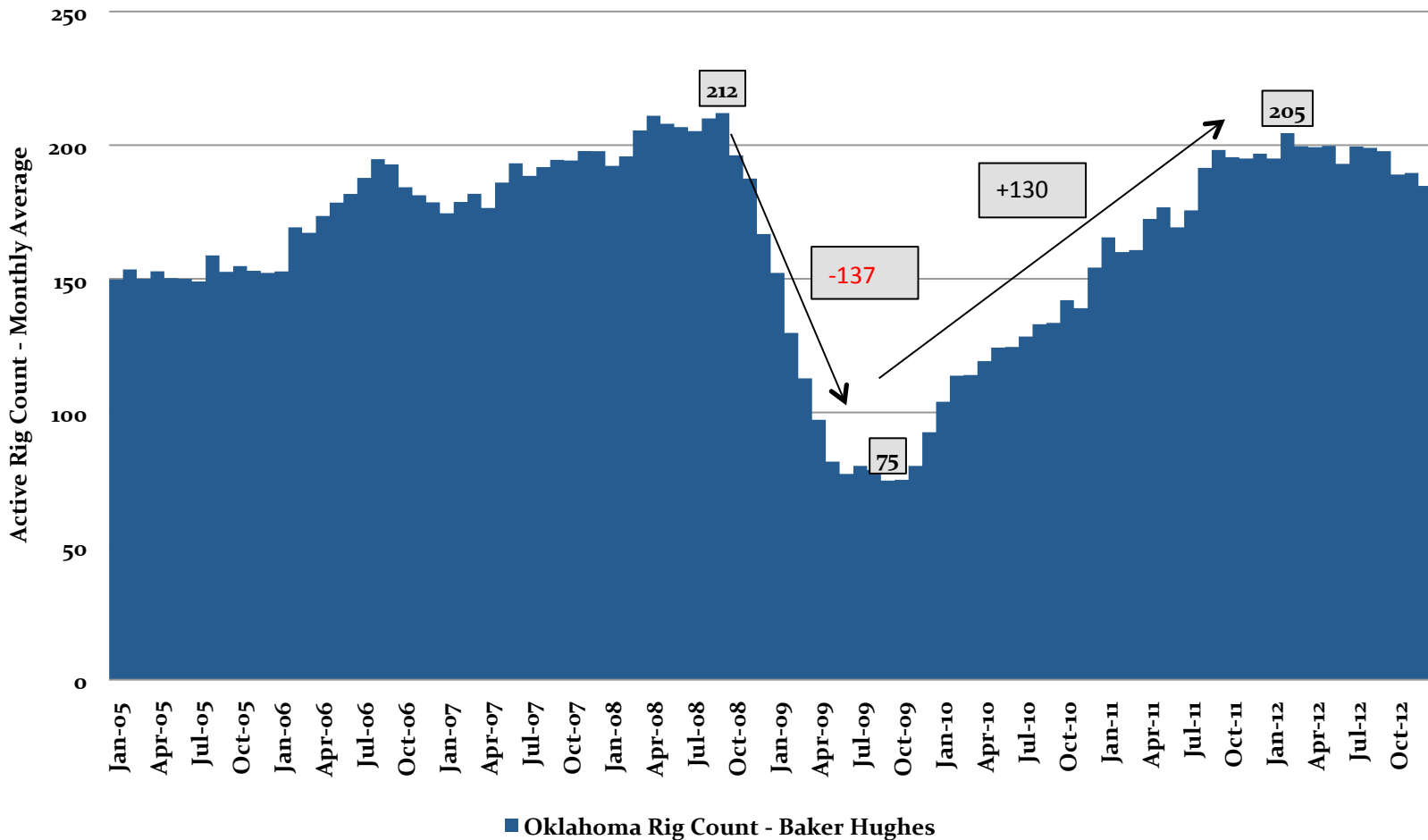
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Oklahoma City MSA Nonfarm Proprietors' Income



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Oklahoma Rig Count - Baker Hughes



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Oklahoma Oil & Natural Gas Industry Direct Employment & Income (2009 & 2011)

	Employment		Percent Share		Labor Income (\$ Mil)		Percent Share		Average Labor Income	
	2009	2011	2009	2011	2009	2011	2009	2011	2009	2011
Employment by Type:										
Wage and Salary	43,814	51,660	61.52%	62.20%	\$4,219	\$4,961	55.22%	52.64%	\$96,290	\$96,032
Self Employed	27,410	31,392	38.48%	37.80%	\$3,421	\$4,463	44.78%	47.36%	\$124,793	\$142,167
Total by Type	71,224	83,052	100.00%	100.00%	\$7,639	\$9,424	100.00%	100.00%	\$107,259	\$113,470
Employment by Activity:										
Production	65,629	75,403	92.14%	90.79%	\$7,357	\$8,922	96.30%	94.68%	\$112,094	\$118,327
Drilling	5,595	7,649	7.86%	9.21%	\$2,828	\$5,017	3.70%	5.32%	\$50,540	\$65,593
Total by Activity	71,224	83,052	100.00%	100.00%	\$7,639	\$9,424	100.00%	100.00%	\$107,259	\$113,470

Source: Bureau of Economic Analysis, Bureau of Labor Statistics, Steven C. Agee Economic Research and Policy Institute



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Economic Impact of Oklahoma Oil & Natural Gas Industry - Production & Drilling, 2011

	Production					Drilling				
	Direct	Indirect	Induced	Total		Direct	Indirect	Induced	Total	Total All Sources
Output (\$ Millions)	\$30,528	\$13,780	\$9,488	\$53,796		\$4,949	\$2,148	\$747	\$7,844	\$61,641
Employment	75,403	71,407	165,736	312,545		7,649	14,763	9,546	31,958	344,503
Value Added (\$ Millions):										
Employee Compensation	\$4,491	\$3,561	\$2,263	\$10,316		\$441	\$587	\$247	\$1,274	\$11,590
Proprietor's Income	\$4,431	\$5,751	\$6,141	\$16,324		\$61	\$159	\$32	\$253	\$16,576
Other Property Income	\$6,843	\$5,194	\$5,495	\$17,532		\$1,321	\$396	\$148	\$1,865	\$19,397
Indirect Business Taxes	\$1,638	\$701	\$1,140	\$3,479		\$38	\$76	\$47	\$161	\$3,640
Source: Bureau of Economic Analysis, IMPLAN, Steven C. Agee Economic Research and Policy Institute										



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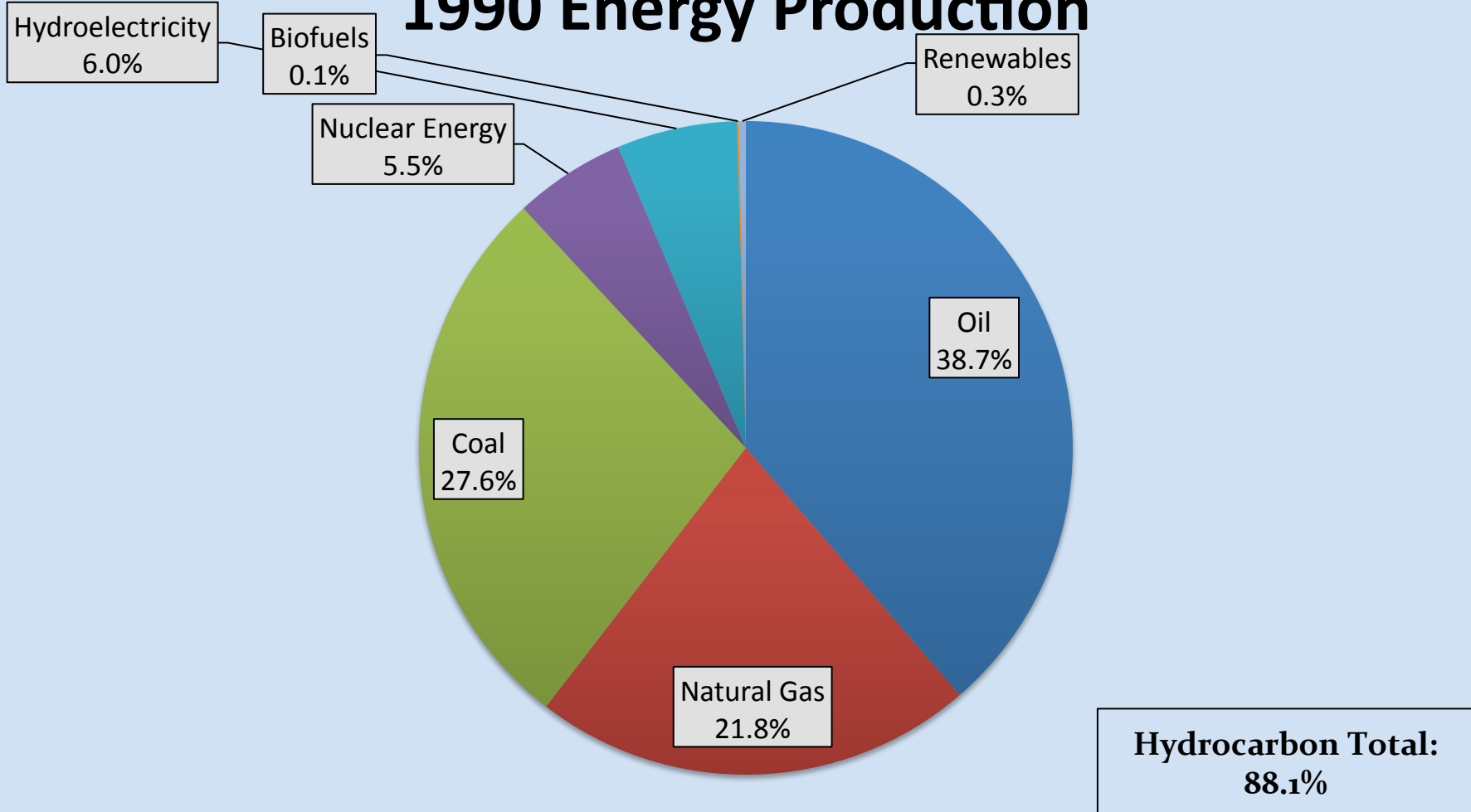
Opportunities and Challenges

- Transitions take time – fossil fuels remain the primary fuel source in the near and medium term
- Renewables are better seen as complements to fossil fuels in an efficient energy system rather than threats to displace production
- Public sentiment and perception on hydraulic fracturing, GHG emissions, etc. will drive regulatory policy
- At some point, market must reflect the price of carbon
 - Carbon tax?



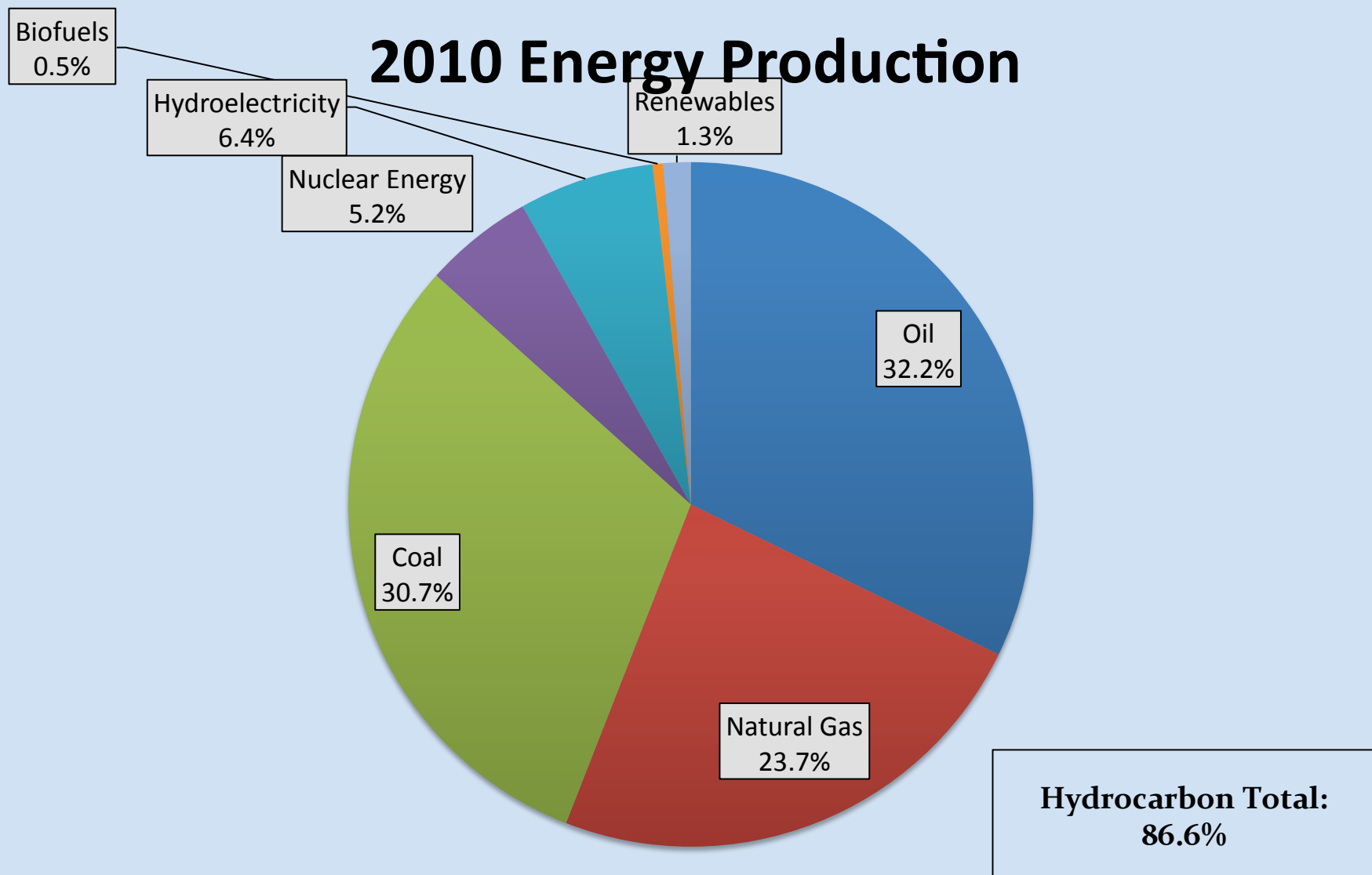
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1990 Energy Production



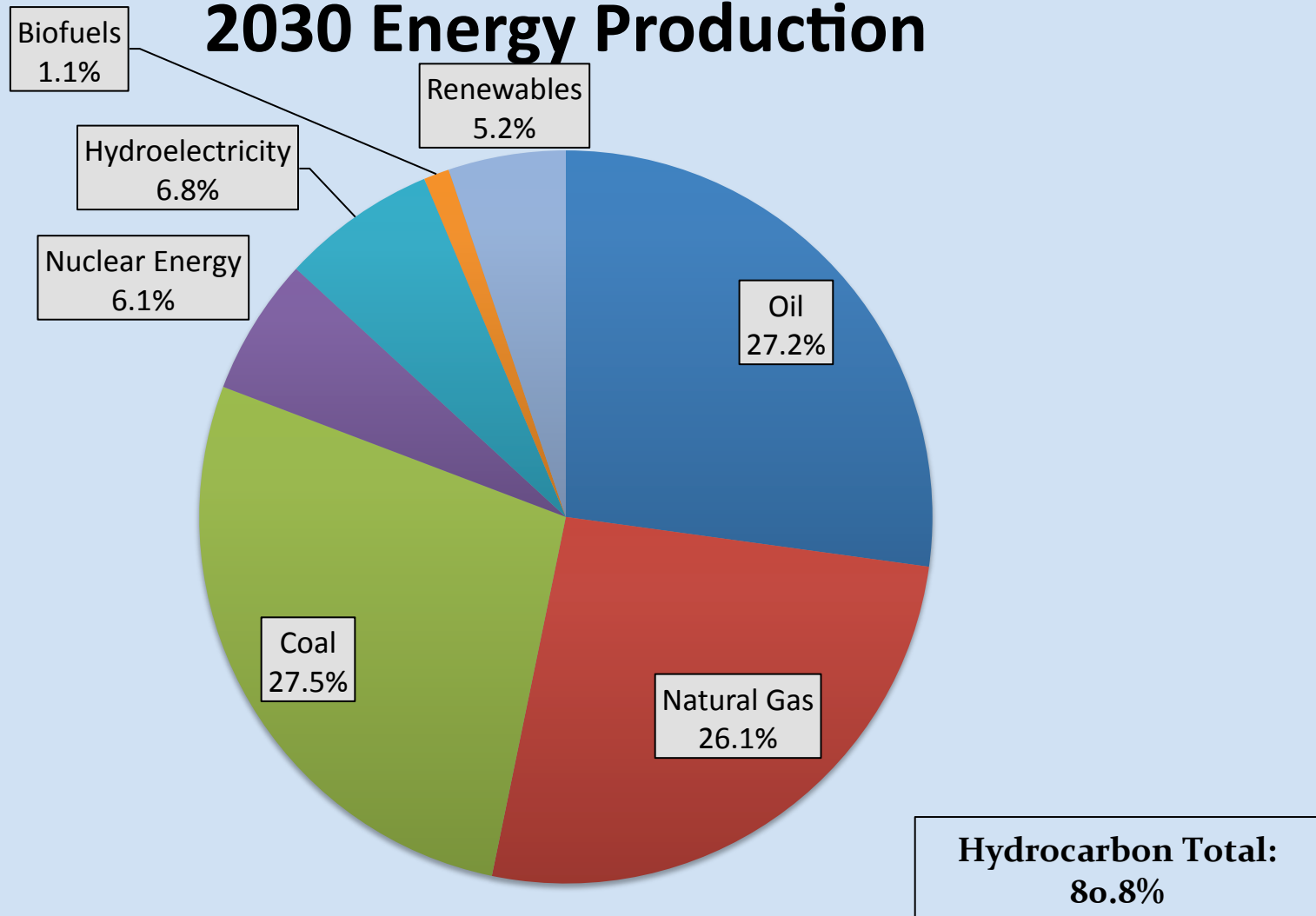
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2010 Energy Production



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2030 Energy Production



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Data Source	Whole Gas, Average Emissions per Completion (Mcf)	Modified, Average Methane Emissions per Completion (Mcf)	Rounded, Average Methane Emissions per Completion (Mcf)
Weatherford	667	555	600
Industry Data Set #1	5,820	4,844	5,000
Devon	11,900	9,905	10,000
William	24,449	20,351	20,000



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Ordinary Least Squares Approach

- **Dependent variable:** Methane Emissions

	Coefficient	Std. Error	t-ratio	p-value	Lower 95% C.I.	Upper 95% C.I.
Const.	8900	4168.53	2.1350	0.12243	-4366.13	22,166.1

- **Conclusion:** The result is not statistically significant.



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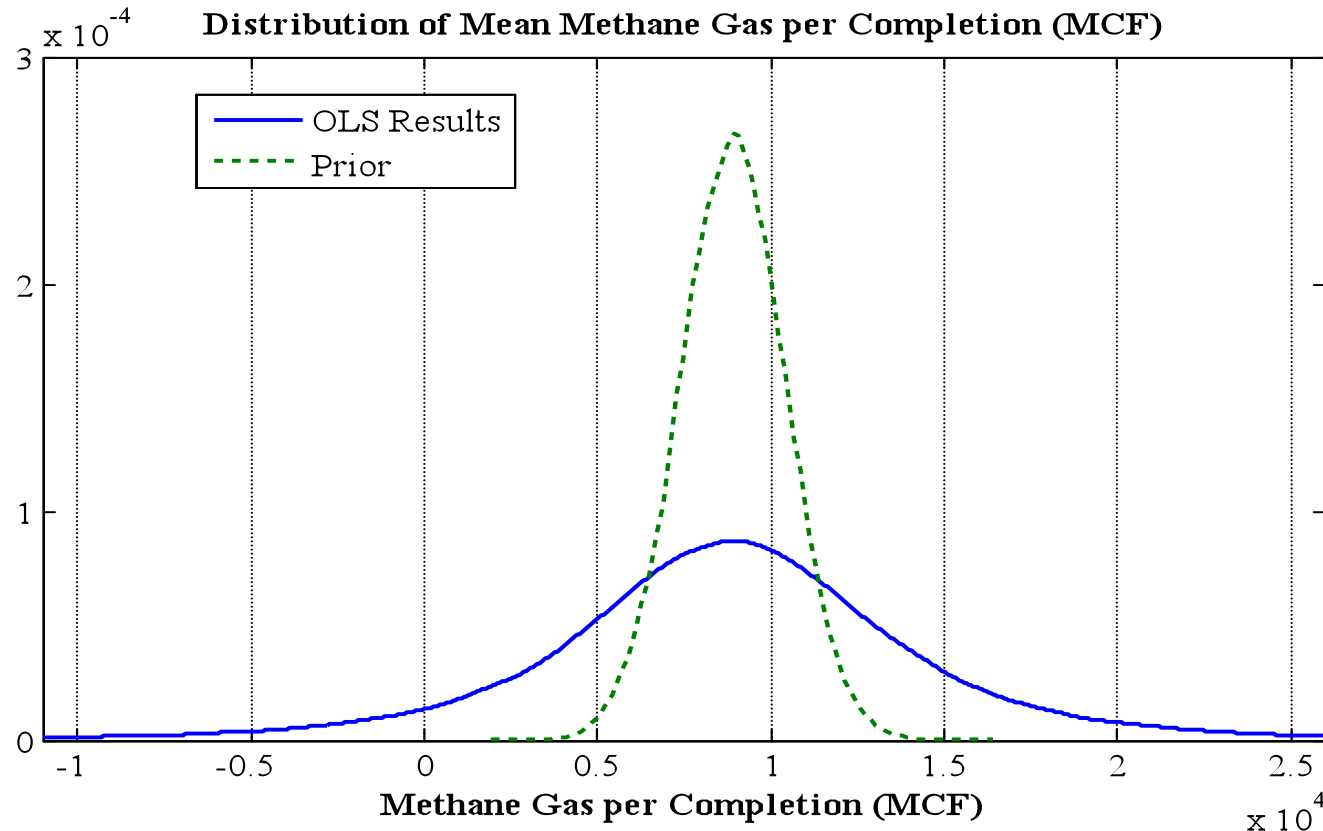
Challenge

- **Objective:** Reduce the size of the confidence interval to make the result statistically significant.
- **Method:** Bayesian Econometrics



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Comparison



Conclusion: Methane emissions are 8900 MCF per well because we say they are!



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Concluding Thoughts

- Oil and Gas remains the state's cornerstone industry
 - Less visible, but as important to Tulsa as to OKC
- Operating paradigms may be shifting, but domestic industry expansion is expected to continue
- Occupational diversity should facilitate non oil and gas economic development
- Regulatory challenges and public perceptions will pose persistent challenges



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